

# FOCUS

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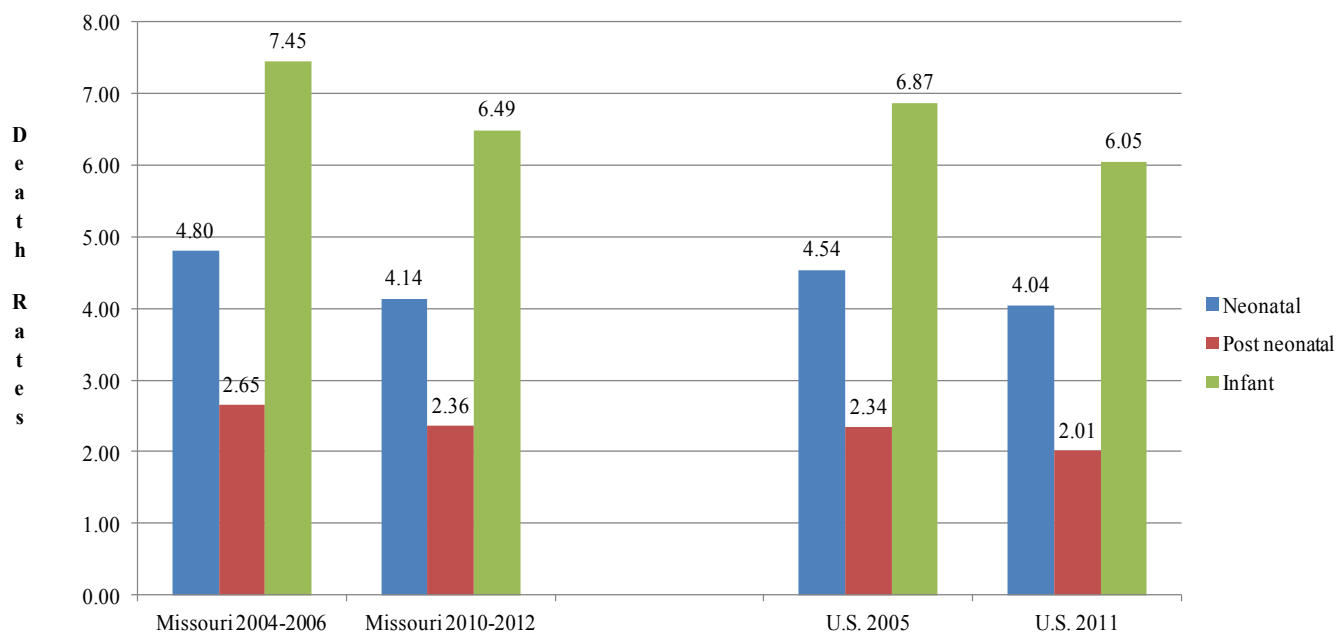
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## Recent Decreases in Infant Mortality in Missouri and the United States

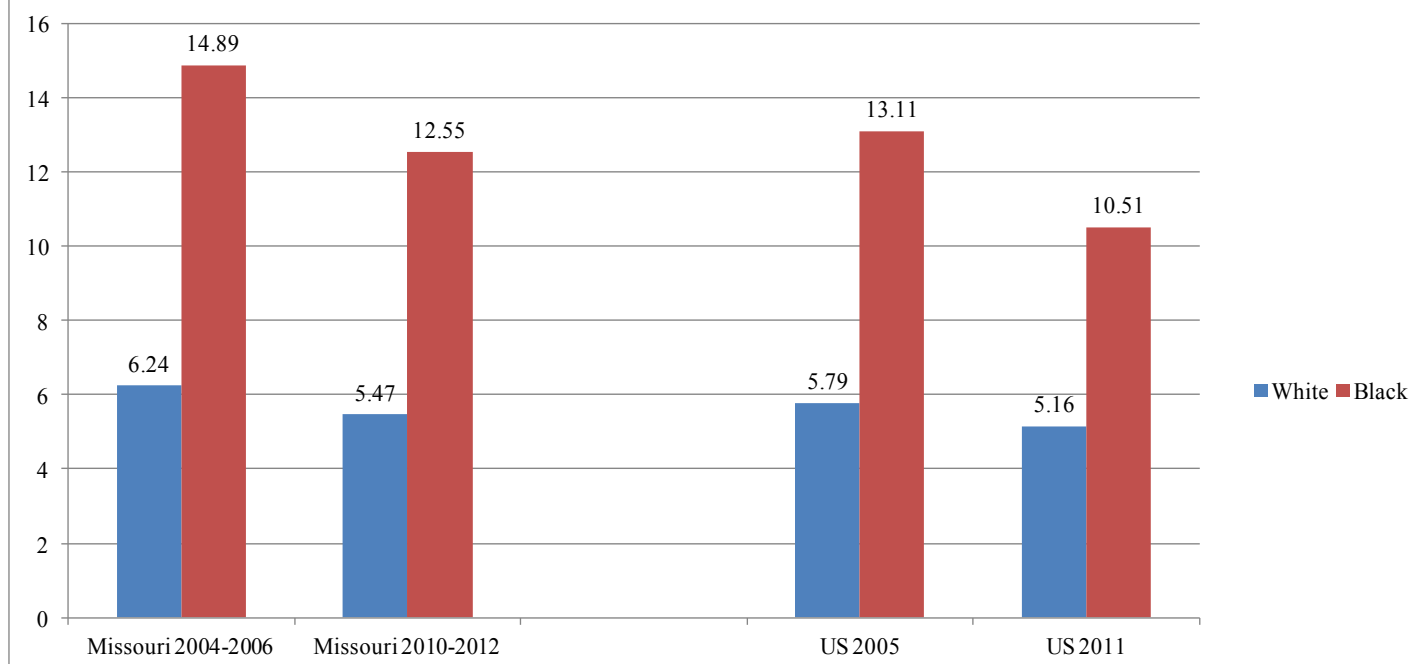
The National Center for Health Statistics recently reported on a 12 percent decline in the national infant death rate from 6.87 per 1,000 live births in 2005 to 6.05 in 2011<sup>1</sup>. Missouri experienced approximately the same decline during a similar time period. From the three year period 2004-2006 to the period 2010-2012, the Missouri infant death rate decreased 13 percent from 7.45 to 6.49 per 1,000 live births. Since the number of infant deaths in Missouri is much smaller than the number nationally, we combined Missouri data into three-year periods. This gives us more stable rates and allows us to better examine the changes in these rates by subcategories of interest such as age at death, race, cause of death, birth weight, and gestational age.

Figure 1 shows the changes in the infant death rates by age for the years of interest in this report. Death rates decreased for both neonatal (age less than 28 days at time of death) and post-neonatal (age 28 days to less than one year) deaths in both Missouri and the US. Missouri rates are higher than the national rates for both age groups and both time periods. In the most recent time period, the Missouri post-neonatal death rate for 2010-2012 was 2.36 per 1,000 live births or 17 percent higher than the US rate in 2011. By contrast, the Missouri neonatal death rate was only 2 percent higher (4.14 vs. 4.04, respectively). Neonatal deaths are primarily related to prematurity while post neonatal deaths are related to such causes as SIDS, unintentional injuries, or birth defects.

Figure 1: Trends in Missouri and United States infant, neonatal and post neonatal death rates per 1,000 live births



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**Figure 2: Trends in Missouri and United States Infant Death Rates per 1,000 Live Births by Race**

As Figure 2 shows, infant death rates decreased substantially for both white and African-American infants in Missouri and nationally for the years of this study. For Missourians, the African-American infant death rate decreased by 16 percent from 14.89 in 2004-2006 to 12.55 per 1,000 live births in 2010-2012, while the white rate decreased by 12 percent from 6.24 to 5.47 in the same time period. Nationally,

the African-American rate decreased by 20 percent, and the white rate declined by 11 percent from 2005 to 2011. The ratio of African-American-to-white infant mortality rates was higher in Missouri for the most recent time period of 2010-2012 (2.29) than nationally in 2011 (2.04). These ratios were higher for both geographic areas six years earlier: 2.39 in Missouri and 2.26 in the US.

**Table 1: Trends in Five Leading Causes of Infant Death: Missouri vs. United States (Rates per 100,000 Live Births)**

	<i>Total Infant Deaths</i>	<i>Perinatal Conditions (P00-P34, P39-P96)*</i>	<i>Congenital Anomalies (Q00-Q99)*</i>	<i>Unintentional Injuries (V01-X59)*</i>	<i>SIDS (R95)*</i>	<i>Infectious Diseases (A00-B99, P35-P39)*</i>	<i>All Other</i>
Missouri 2004-2006	745	339.6	161.6	48.0	60.6	23.1	112.0
Missouri 2010-2012	650	280.0	135.9	80.2	28.9	28.0	96.5
United States 2005	687	323.4	134.2	26.2	53.9	37.9	111.6
United States 2011	605	281.5	126.1	27.5	43.3	32.1	94.3
Percent Difference							
MO 2004-06 vs US 2005	8.4	5.0	20.4	83.2	12.4	-39.1	0.4
Percent Difference							
MO 2010-12 vs US 2011	7.4	-0.5	7.8	191.6	-33.3	-12.8	2.3

Note: These categories are also used in Missouri Vital Statistics 2011 (Table 23).

\* ICD-10 Codes

Table 1 shows trends in the five leading causes of infant death. The leading cause for both areas and for all years studied was perinatal conditions, which are primarily related to prematurity and most likely to cause neonatal death. These conditions originate in the perinatal period (a few months before to about one week after childbirth). Congenital anomalies, or birth defects, are the second leading cause for both areas and time periods. These can lead to both neonatal and post-neonatal deaths. Decreases occurred in both of these leading cause categories for both areas, and there was not a large difference in the rates for these causes between the state and nation in the most recent time periods compared.

In Missouri, the third leading cause of infant death for 2010-2012 was unintentional injuries. Unintentional injuries were only the fifth leading cause of infant death nationally in

2011. The Missouri unintentional injury death rate of 80.2 per 100,000 live births for 2010-2012 was nearly three times the national rate of 27.5 in 2011. Nearly 84 percent of these deaths in Missouri from 2010-2012 were attributed to various accidental threats to breathing, including suffocation in bed. Meanwhile, SIDS (Sudden Infant Death Syndrome) was the third leading cause of infant deaths nationally and the rate was about 50 percent higher in the US in 2011 compared to the 2010-2012 Missouri rate. There may be some confusion in distinguishing between SIDS and accidental threats to breathing for purposes of properly classifying the cause of death. However, even if the deaths due to SIDS and unintentional injuries were evaluated together, the Missouri combined rate would still be about 50 percent higher than the national combined rate. This elevated rate of unintentional injuries/ SIDS is a primary reason for the overall elevated post-neonatal death rate in Missouri.

**Table 2: Missouri vs. US Birth Weight-specific and Gestational Age-specific Death Rates per 1,000 Live Births by Age at Death**

<i>Birth Weight</i>	<i>Live Births</i>	<i>Infant Deaths by Age</i>			<i>Infant Death Rates by Age</i>		
		<i>Total</i>	<i>Neonatal</i>	<i>Post neonatal</i>	<i>Total</i>	<i>Neonatal</i>	<i>Post neonatal</i>
<b>Missouri 2010-12</b>							
<1500 g.	3,227	679	597	82	210.4	185.0	25.4
1500-2499 g.	14,911	229	136	93	15.4	9.1	6.2
≥2500	209,210	493	163	330	2.4	0.8	1.6
Total	228,187	1,471	957	514	6.4	4.2	2.3
<b>United States 2010</b>							
<1500 g.	58,806	13,064	11,385	1,679	222.2	193.6	28.6
1500-2499 g.	267,995	3,597	2,035	1,562	13.4	7.6	5.8
≥2500	3,671,997	7,821	2,687	5,134	2.1	0.7	1.4
Total	3,999,386	24,572	16,193	8,379	6.1	4.0	2.1
<b>Gestational Age</b>							
<b>Missouri 2010-12</b>							
<32 weeks	4,461	723	636	87	162.1	142.6	19.5
32-36 weeks	22,842	209	113	96	9.1	4.9	4.2
37+ weeks	200,505	518	190	328	2.6	0.9	1.6
<b>United States 2010</b>							
<32 weeks	78,442	12988	NA	NA	165.6	NA	NA
32-36 weeks	400,348	3394	NA	NA	8.5	NA	NA
37+ weeks	3,515,317	8002	NA	NA	2.3	NA	NA

Note: Infant Mortality based on Birth Cohort (infants born in given year that died before first birthday, death record linked to corresponding birth record).

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Infant mortality counts and rates by birth weight and gestational age are presented in Table 2. As this information comes from the birth certificate, the data is presented by birth cohort (i.e. the year of birth) while the data from the previous exhibits were based on the death cohort (i.e., the year of death). Data from birth and death cohorts will not match exactly, but the differences are fairly minor. This table shows the dramatic effect that low birth weight and prematurity have on infant mortality. While very low birth weight (<1500 grams, or 3.3 pounds) infants made up less than 1.5 percent of all live births, they accounted for about half of all infant deaths. Similarly, infants born before 32 weeks gestation accounted for about 2 percent of births and half of infant deaths.

As Table 2 shows, Missouri does well at keeping very low birth weight infants alive as the Missouri infant death rate of very low birth weight infants for 2010-2012 of 210.4 per 1,000 live births was slightly less than the national rate in 2010 of 222.2<sup>2</sup>. Similarly, the infant death rate for very early gestational age (<32 weeks) babies was lower in Missouri than the US. Missouri also had a slightly lower rate of very low birth weight infants (1.41 percent in Missouri vs. 1.47 percent in the US). However, for moderately low birth weight (1500-2499 grams, or 3.3-5.4 pounds) and normal birth weight (>2500 grams, or >5.5 pounds), the Missouri death rates were higher than the national rates. The data shows that normal birth weight babies are at greater risk of dying during the post-neonatal period while the moderately low birth weight babies have a large proportion dying in both age groups.

In summary, Missouri infant mortality decreased by 13 percent from 2004-2006 to 2010-2012,

which is similar to the 12 percent decline nationally from 2005 to 2011. However, Missouri's infant death rate remains seven percent above the national rate. In fact, the Missouri infant death rate has not been below the national rate since 1995. Large decreases in mortality occurred among both white and African-American infants, but the African-American rate remains more than double the white rate.

While Missouri infant death rates were higher than the US rates in both neonatal and post-neonatal periods, there were greater differences in post-neonatal death rates. Unintentional injuries involving accidental threats to breathing appear to be a major contributor to the higher rates of post-neonatal deaths in Missouri. Consistent application of clear guidelines for distinguishing between SIDS and deaths due to accidental threats to breathing is needed in order to adequately assess the risks and causes of post-neonatal deaths, and determine the public health response.

Prematurity/low birth weight is the major cause of infant mortality, and reducing these types of births is important in any effort to reduce infant mortality. Additionally, improving the safety of the infant sleep environment is critical to reducing post-neonatal death, especially in Missouri.

#### References:

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2. Mathews TJ, MacDorman MF. Infant mortality statistics from the 210 period linked birth/infant death data set. National Vital Statistics Reports. Hyattsville, MD: National Center for Health Statistics. Dec. 18, 2013.